PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P18047WO	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/IB 03/04526	International filing date *(day/month/year)* 14.10.2003	Priority date *(day/month/year)* 14.10.2003

International Patent Classification (IPC) or both national classification and IPC
H04Q7/24

Applicant
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1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 5 sheets.

3. This report contains indications relating to the following items:

   I   ☒   Basis of the opinion

   II ☐   Priority

   III ☐   Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

   IV ☐   Lack of unity of invention

   V   ☒   Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

   VI ☐   Certain documents cited

   VII ☐   Certain defects in the international application

   VIII ☐ Certain observations on the international application

Date of submission of the demand 16.05.2005	Date of completion of this report 23.01.2006
Name and mailing address of the International preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Goedhart, A Telephone No. +49 89 2399-7135

Form PCT/IPEA/409 (Cover Sheet) (January 2004)   BEST AVAILABLE COPY

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)):*

Description, Pages

1, 2, 4-7	as originally filed
3, 3a	filed with telefax on 15.09.2005

Claims, Numbers

1-7	filed with telefax on 15.09.2005

Drawings, Sheets

1/3-3/3	as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description,   pages:
- ☐ the claims,   Nos.:
- ☐ the drawings,   sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-7
	No:	Claims	--
Inventive step (IS)	Yes:	Claims	1-7
	No:	Claims	--
Industrial applicability (IA)	Yes:	Claims	1-7
	No:	Claims	--

2. Citations and explanations

   see separate sheet

Reference is made to the following documents:

D1 = US 6 178 172 B1
D2 = WO 01/15465 A2
D3 = WO 98/51096 A1

A.   Remarks regarding clarity of the present application:

1.   **Claim 1** does not meet the requirements of Article 6 PCT, as it appears that the
     feature of **claim 1** of "automatically distributing capability and configuration
     information from a first server to servers neighboring the first server when a service is
     initiated in the first server" is not supported by the description.

2.   **Claim 1** does not meet the requirements of Article 6 PCT, as the formulation "upon
     determining that the given neighboring server does not support the service, sending
     from the first server to the given neighboring serve only information that is supported
     by the given neighboring server" is unclear, as it appears from the description that no
     information relating to the initiated service is sent to the neighboring server in this
     case (see description page 7, lines 10 to 12; figure 2).

3.   **Claims 1 and 5** do not meet the requirements of Article 6 PCT, as the essential
     feature that the initiated service requires participation of a neighboring server (see
     description page 7, lines 7 and 8) is not included in said claims.

4.   **Claim 5** does not meet the requirements of Article 6 PCT, as it appears from the
     description that the first telecommunication server determines whether or not the
     neighboring server supports the service (see in particular description page 7, lines 7
     to 20; figure 2) and not "which information related to the initiated service is supported
     by the neighboring server", as defined in **claim 5**.

B.   Concerning Box No. V:
(Reasoned statement with regard to novelty, inventive step and industrial
applicability)

1.   The above-mentioned lack of clarity notwithstanding, the following is noted:

Claim 1 is directed to a method of reducing signalling and processing requirements in a mobile communication network having a plurality of neighboring telecommunication servers. In the method according to **claim 1**, capability and configuration information is distributed among the plurality of telecommunication servers when one of the servers is started up.

The document **D2** is regarded as being the closest prior art to the subject-matter of **claim 1** and discloses a method of handling subscriber services in a Wireless Intelligent Network (WIN). When a serving Mobile Switching Center (MSC) does not support a WIN trigger required to support a particular service requested by a subscriber, the Home Location Register queries identified Service Control Points for call-treatment instructions (see D2: page 3, lines 15 to 27).

In the method according to the present application, when a service is initiated in a first server, that requires the participation of a neighboring server, the first server is able to determine, without contacting the neighboring server, whether the neighboring server supports the service. The first server sends information relating to the initiated service to the neighboring server only if the service is supported by the neighboring server, thus reducing the signalling and processing requirements in a mobile communication network.

Such a method is not disclosed in, or derivable from, document **D2**.

The further cited documents **D1** and **D3** relate to the synchronization of databases in telecommunication systems. In particular, document **D1** discloses the exchange of PNNI Topology State Element (PTSE) messages between nodes of an ATM network, in order to synchronize the topology databases of the nodes (see D1: column 2, lines 1 to 48) and document **D3** discloses a method for performing Service Control Point (SCP) database synchronization for redundancy and loadsharing reasons (see D3: page 8, line 25 to page 9, line 24).

However, the information which is transferred during the database synchronization as disclosed in the documents **D1** and **D3** does not relate to services which require a

participation between telecommunication servers.

Thus, it is considered that the skilled person would not derive the method according to the present application from the disclosure of the cited documents **D1, D2** and **D3**.

Therefore, although **claim 1** is not clear (see Article 6 PCT) in its present form (see the comments made in section A), it is considered that the principle which forms the basis for **claim 1** is new (see Article 33(2) PCT), involves an inventive step (see Article 33(3) PCT) and is also industrially applicable (see Article 33(4) PCT).

2.   The same considerations as presented in paragraph 1 regarding **claim 1** also apply to independent **claim 5**, directed to a telecommunication server corresponding to the method of **claim 1**.

Therefore, although **claim 5** is not clear (see Article 6 PCT) in its present form (see the comments made in section A), it is considered that the principle which forms the basis for **claim 5** is equally new (see Article 33(2) PCT), involves an inventive step (see Article 33(3) PCT) and is also industrially applicable (see Article 33(4) PCT).

3.   The dependent **claims 2 to 4, 6 and 7** are advantageous embodiments of the method of **claim 1** and the telecommunication server of **claim 5**, respectively. Said dependent claims therefore also meet the requirements of Articles 33(2), 33(3) and 33(4) PCT with respect to novelty, inventive step and industrial applicability.

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Published International Application WO 01/15465 discloses a method of handling subscriber services in a Wireless Intelligent Network (WIN) when a serving MSC does not support all WIN triggers. When a mobile station seeks access, the MSC is triggered to send an invoke message to the HLR with a WIN

5   Capabilities parameter indicating the WIN triggers supported by the MSC. Although some capabilities information is shared, the amount of information is limited, and it is only shared when a mobile station seeks access. The information is not shared ahead of time so that network signaling and processing can be reduced.

10   Published International Application WO 98/51096 discloses a method for performing SCP database synchronization. The method enables expansion of SCP pairs by migrating records between SCPs when expansion is required. However, there is no disclosure or suggestion of sharing capability and configuration information between network servers so that network signaling and

15   processing can be reduced.

Thus, there is much inefficiency in the existing procedures for achieving interoperability between MSCs in a mobile communication network. It would be advantageous to have a system and method for achieving interoperability by automatically distributing capability and configuration information between

20   MSCs.

Summary of the Invention

The present invention enables interoperability between MSCs by causing each MSC to send operational information such as capability and configuration

25   information to neighboring MSCs following a reconfiguration, reset, or any other procedure that may have changed the capabilities or configuration of the affected MSC. Each neighboring MSC that supports the invention responds by sending its own capability and configuration information to the affected MSC. Thereafter, each MSC uses its knowledge of the capabilities and configuration of

30   neighboring MSCs to send only the information that is needed to implement requested services or features.

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Thus, in one aspect, the present invention is directed to a method of automatically distributing operational information between MSCs in a mobile communication network. The method includes the steps of defining for each MSC in the network, at least one neighboring MSC; performing a procedure that

5 changes the first MSC's operational information; and upon completion of the procedure, automatically sending the first MSC's operational information from the first MSC to the first MSC's neighboring MSCs. This is followed by receiving and storing the first MSC's operational information in each of the first MSC's neighboring MSCs; and upon receiving the first MSC's operational information,

10 sending operational information for each of the first MSC's neighboring MSCs from the neighboring MSCs to the first MSC. The operational information may include capability and configuration information.

In another aspect, the present invention is directed to a method of reducing signaling and processing requirements in a mobile communication

15 network having a plurality of neighboring MSCs. The method includes the steps of automatically distributing operational information between the MSC's

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WHAT IS CLAIMED IS:

1.   A method of reducing signaling and processing requirements in a mobile communication network having a plurality of neighboring

5   telecommunication servers, said method comprising the steps of:

automatically distributing capability and configuration information between the server's whenever one of the servers is started up, said distributing step including:

starting-up one of the servers;

10   automatically sending the capability and configuration information for the start-up server, from the start-up server to servers neighboring the start-up server;

receiving and storing the start-up server's capability and configuration information in each of the neighboring servers; and

15   upon receiving the start-up server's capability and configuration information, sending capability and configuration information for each of the neighboring servers from the neighboring servers to the start-up server; and

automatically distributing capability and configuration information from a first server to servers neighboring the first server when a service is initiated in

20   the first server, said distributing step including:

initiating the service in the first server; and

determining by the first server, whether a given neighboring server supports the service, based upon the capability and configuration information for the given neighboring server that the first server has received from the given

25   neighboring server;

upon determining that the given neighboring server does not support the service, sending from the first server to the given neighboring server, only information that is supported by the given neighboring server; and

upon determining that the given neighboring server supports the

30   service, sending from the first server to the given neighboring server, information relating to the initiated service.

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2.   The method of claim 1, wherein the telecommunication servers are Mobile Switching Centers (MSCs).

3.   The method of claim 1, wherein the telecommunication servers are
5   Mobile Switching Centers (MSCs), and the capability and configuration information sent by a given MSC includes an indication of a version of an industry standard with which the given MSC is compliant.

4.   The method of claim 1, wherein the telecommunication servers are
10   Mobile Switching Centers (MSCs), and the capability and configuration information sent by a given MSC includes an indication of a version of an industry standard with which the given MSC is compliant, together with exceptions for any capabilities of the version of the standard that are not supported by the given MSC.
15

5.   A telecommunication server that automatically distributes capability and configuration information for the server to neighboring telecommunication servers in a mobile communication network, said telecommunication server comprising:
20   a communication signaling mechanism that automatically sends the server's capability and configuration information to at least one neighboring server upon start-up of the server, and receives in return, capability and configuration information for the at least one neighboring server;
    means for storing the capability and configuration information for the at
25   least one neighboring server;
    means for initiating a service;
    means for determining from the stored capability and configuration information for the at least one neighboring server, which information related to the initiated service is supported by the at least one neighboring server; and
30   means for sending to the at least one neighboring server, only the service-related information that is supported by the at least one neighboring server.

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6.   The telecommunication server of claim 5, wherein the server is a
Mobile Switching Center (MSC), and the communication signaling mechanism
sends the MSC's capability and configuration information to at least one
5   neighboring MSC upon start-up of the MSC.

7.   The telecommunication server of claim 6, wherein the
communication signaling mechanism also automatically sends the MSC's
capability and configuration information to the at least one neighboring MSC
10   whenever the capability and configuration information of the MSC is changed.